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Research Note

Is There a Cognate Effect in Bilingual Children With Developmental Language Disorder?

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ABSTRACT

Purpose: Cognates, words in two languages that share form and meaning, can be used to support vocabulary development in bilingual children. Typically developing bilinguals have shown better performance on cognates versus noncognates. Of key interest is whether bilinguals with developmental language disorder (DLD) also show a cognate effect and, if so, which factors are related to their cognate performance.
Method: Thirty-five Spanish–English bilingual children (5–11 years old) with DLD completed the Expressive and Receptive One-Word Picture Vocabulary Tests, third edition, in English (EOW, ROW) to measure cognate performance. Test items were divided by difficulty level (easy, medium, and hard) and classified as cognates or noncognates using the Cross-Linguistic Overlap Scale for Phonology.
Results: On average, children showed clear and robust cognate effects on EOW across difficulty levels with medium-to-large effect sizes. Results on the ROW showed minimal effects that varied by difficulty. Individually, 80% of participants (28 of 35) demonstrated a cognate effect in EOW, whereas only 31% (11 of 35) showed an effect in ROW. A cognate effect in ROW was positively correlated with age and English proficiency, whereas no factors correlated with the EOW cognate effect.
Conclusions: Bilingual children with DLD show higher performance on cognates than noncognates, at least in expressive vocabulary. Participants who did show a receptive cognate effect tended to be older and have higher English proficiency. Further investigation is needed to identify factors underlying cognate performance in order to tailor intervention strategies that promote bilingual vocabulary development.

About two children in every classroom have developmental language disorder (DLD), defined by low language performance in the face of normal development (Norbury et al., 2016). Many children with DLD present with a smaller vocabulary size (e.g., Watkins et al., 1995) and word learning difficulties (see meta-analysis by Kan & Windsor, 2010). Because vocabulary is a key predictor of reading comprehension (Verhoeven & Perfetti, 2011), children with DLD are at a greater risk of developing reading problems (Adlof, 2020).

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Bilingual children with DLD show low performance in both of their languages as compared to typical peers of similar age and language experience (Kohnert et al., 2020). For bilinguals, lexical deficits of DLD will span across two languages (e.g., McMillen et al., 2020). However, one area of strength in bilingual vocabulary development is the ability to leverage knowledge across languages, which at the lexical level is highlighted in cognate performance. Cognates refer to a pair of words in two different languages with phonological similarities and shared meaning, such as *sofa* (English) and *sofá* (Spanish), whereas noncognates are word pairs that share meaning but do not have phonological similarities, such as *swing* (English) and *columpio* (Spanish). Understanding how

bilingual children with DLD perform on cognates can lead to refined assessment measures and tailored intervention strategies to promote dual language development (Potapova & Pruitt-Lord, 2020).

There is a robust literature with typical bilingual adults showing that cognates are identified and named with higher accuracy and faster speed than noncognates (e.g., Robinson Anthony & Blumenfeld, 2019). Similarly, Spanish–English bilingual students in middle and high school have shown higher accuracy on orthographical (written) cognates, which in turn can support academic performance in English (Lubliner & Hiebert, 2011; Nagy et al., 1993). Younger children have also shown sensitivity to phonological (spoken) cognates in preschool and the early school grades. In a systematic review, Squires et al. (2020) found 16 empirical studies (a total of 849 participants) on cognate performance in bilingual children, ages 3–8 years, of which 12 studies showed higher accuracy and faster speed on cognate items compared to noncognates. Less is known about cognate performance in bilingual children with DLD. In their systematic review, Squires et al. did not find any studies that included bilinguals with a language disorder published between 1987 and March 2017.

Initial Findings From Bilingual Children With DLD

To our knowledge, there have been three empirical studies of cognate performance that have included bilingual children with language disorders. One study examined picture naming among bilingual children with DLD (Grasso et al., 2018), and two studies examined cognate performance within language intervention (Dam et al., 2020; Kambanaros et al., 2017).

Grasso et al. (2018) compared bilingual children, ages 5–9 years, with and without specific language impairment (SLI) on their ability to name cognates versus noncognates from the English and Spanish versions of the Expressive One-Word Picture Vocabulary Test, third edition (Brownell, 2000a, 2001). As expected, children with SLI showed lower overall accuracy on picture naming than their typically developing (TD) peers. However, in both TD and SLI groups, there was a higher likelihood that cognates (vs. noncognates) would be named correctly in both languages and that cognates named correctly in one language would also be named correctly in the other language. These likelihood patterns did not hold for noncognate items, reflecting an advantage for naming cognates. In summary, even though bilingual children with a language disorder named fewer pictures overall, they showed a cognate advantage to the same degree as their TD bilingual peers (Grasso et al., 2018).

Capitalizing on cognates as intervention targets, Kambanaros et al. (2017) conducted a case study with a multilingual 8-year-old child with language impairment. The child completed an intervention in which she named pictures in English that were cognates in her two other languages, Bulgarian and Greek. Following intervention, the child showed high accuracy in English picture naming and some improvement on cognates in the two untreated languages. This case study showed a certain degree of cross-linguistic transfer as well as the feasibility of selecting cognates as intervention targets.

In addition to target selection, Dam et al. (2020) explored whether explicit instruction on cognates could improve vocabulary learning. Dam et al. (2020) provided vocabulary intervention to 12 Spanish–English bilingual children, ages 6–8 years, who were TD or had DLD. Intervention consisted of storybook activities in Spanish and explicit instruction on the key differences between cognate and noncognate targets. Results showed increases in cognate and noncognate naming and relatively greater gains in naming cognates (Dam et al., 2020). This pilot intervention highlighted the potential for explicit instruction on cognates to support bilingual vocabulary learning.

Factors Associated With Cognate Performance

While many studies have found a cognate effect in bilingual children, not all participants within a given study show the effect. Studies that include individual-level analysis have reported that approximately 60%–80% of participants show a cognate effect (Kelley & Kohnert, 2012; Robinson Anthony & Blumenfeld, 2019). For TD bilingual children, several factors can influence cognate performance, including two factors related to methodology (cognate classification and task type) and two factors related to participant characteristics (age and language proficiency).

Regarding cognate classification, one commonly used objective measure is the Cross-Linguistic Overlap Scale for Phonology (COSP; Kohnert et al., 2004). The COSP quantifies the similarity between word pairs based on the initial sound, number of syllables, percent overlapping consonants, and percent overlapping vowels. Most studies employing the COSP have found a cognate effect (five of seven studies, summarized by Squires et al., 2020). Studies that did not find a cognate effect suggested that using a combination of objective and subjective measures could be employed to define cognates (Potapova et al., 2016) or that other factors such as word difficulty might be in play (Wood & Peña, 2015). This study uses the COSP to compare results to the extant literature with TD bilinguals (see review by Squires et al., 2020). Specifically, we aim to replicate and extend findings from Kelley and Kohnert (2012), which employed the COSP, to identify cognates in receptive and expressive vocabulary tasks.

Studies have employed two general types of tasks to study cognate accuracy in bilingual children: standardized vocabulary tests and experimental tasks. To date, most studies on cognate performance have used standardized tests (for a review, see Squires et al., 2020). Several limitations to this approach have been noted. Because standardized vocabulary tests were not originally designed to study cognates, the number of cognate and noncognate items differ. For example, Kelley and Kohnert (2012) reported 94 cognates and 110 noncognates on the Peabody Picture Vocabulary Test, third edition. Additionally, standardized vocabulary tests are designed to increase in difficulty with easier items preceding more difficult ones. Increasing difficulty level generally corresponds to decreasing word frequency on vocabulary tests (e.g., Goriot et al., 2021). However, word frequency can differ across languages, making this a potential limitation for using standardized test results to analyze cognate performance. For example, *construct* and *construir* are cognates descended from the same Latin word. However, *construir* in Spanish is much more frequently used in everyday communication than *construct* in English (Lubliner & Hiebert, 2011). Indeed, studies that have created experimental tasks controlling for task-level factors (e.g., Sheng et al., 2016) have found more robust cognate effects than studies using standardized vocabulary tests. With these limitations noted, performance from vocabulary tests can still provide useful information on the presence of a cognate effect in diverse populations. Data collection with individual bilingual children is a time- and resource-intensive endeavor. Secondary analysis of vocabulary test performance can be used to leverage existing data sets.

Tasks used to measure cognate performance can also vary by receptive or expressive modality. Modality is important to consider because it corresponds to different task demands. Receptive vocabulary tasks require an individual to identify a word they hear, whereas expressive vocabulary tasks require individuals to generate a word themselves, which can be more challenging. Kelley and Kohnert (2012) used two tests of English expressive and receptive vocabulary, the Expressive One-Word Picture Vocabulary Test, third edition (EOW; Brownell, 2000a) and the Peabody Picture Vocabulary Test, third edition (PPVT-III; Dunn & Dunn, 1997), to examine cognate performance in 30 Spanish–English bilinguals, ages 8–13 years. Though cognate effects were found across tasks, relatively larger effects were found using the expressive task (small to medium effect sizes) compared to the receptive task (very small to small effect sizes). At the individual level, 83% of participants (25 of 30) showed a cognate effect on the expressive task, whereas only 60% of participants (18 of 30) showed a cognate effect on the receptive task.

In addition to task-level factors, participant characteristics can influence cognate performance. Chronological age, a general index of maturation, was related to cognate performance in seven of nine studies summarized in Squires et al. (2020): Children showed gradual changes in cognate effects over time, with the largest cognate effects in older children. Older children may show greater cognate effects given their increased vocabulary knowledge and exposure to cognates in spoken and written forms (e.g., Nagy et al., 1993). Nonetheless, age can interact with other factors such as modality. Kelley and Kohnert (2012) found a positive correlation between age and a cognate effect on a receptive task ($r = .51$, $p = .004$) but no correlation between age and a more robust cognate effect on an expressive task ($r = .21$, $p = .26$).

Another participant characteristic to consider is language proficiency. For bilingual children, proficiency in each language can fluctuate depending on the task itself and current levels of language exposure (Kohnert et al., 2020). Because proficiency can be measured in a variety of ways and can change over time, there have been mixed findings on the association between proficiency and cognate effects.

Studies that have used parental report of children's language exposure have shown larger cognate effects in the relatively weaker language. In a study of 89 TD bilingual kindergarten and first graders, Pérez et al. (2010) found an interaction between language exposure and cognate status: Children with more exposure to Spanish identified more cognates than noncognates on an English test (Test of Language Development–Primary: Third Edition Picture Vocabulary Subtest; Newcomer & Hammill, 1997). Children with balanced exposure across languages did not show a cognate effect (i.e., same accuracy for cognates as noncognates), and children with more exposure to English showed an opposite effect (i.e., higher accuracy on noncognates than cognates). Similarly, in a recent study of 46 Spanish–English bilingual preschoolers, Robinson Anthony and Blumenfeld (2019) also found language proficiency to influence cognate accuracy. Researchers measured the difference in exposure across languages (i.e., English minus Spanish exposure) and found that Spanish-dominant children showed a greater cognate effect on an English receptive vocabulary test (PPVT-III) than children with balanced exposure to both languages.

For studies that have employed direct measures of children's language, associations between proficiency and cognate effects have been less evident. Kelley and Kohnert (2012) measured proficiency using the Spanish and English versions of the Clinical Evaluation of Language Fundamentals–Fourth Edition (CELF-4S, Wiig et al., 2006; CELF-4E, Semel et al., 2003). Though researchers found a positive correlation between a cognate effect and age, correlations with proficiency measures did not reach statistical significance in expressive or receptive modalities. Different results across studies could be in part driven by different measures of proficiency. Nonetheless,

the question of whether proficiency is robustly related to cognate performance remains open. This study extends the investigation of these task- and child-level factors to a disordered population.

This Study

This study builds on the emerging literature of cognate performance in bilingual populations with a language disorder. In a sample of 35 school-age Spanish–English bilinguals with moderate-to-severe DLD, we examined English performance on receptive vocabulary and expressive vocabulary to address the following two research questions:

1. Do bilingual children with DLD identify more cognates than noncognates?
2. Do bilingual children with DLD name more cognates than noncognates?
3. What factors are associated with cognate performance?

Based on findings from TD bilingual children (for a review, see Squires et al., 2020), as well as the emerging literature on bilingual children with DLD (e.g., Grasso et al., 2018), we predicted that our sample of bilinguals with DLD would show a cognate effect, as measured by greater accuracy on cognate than noncognate items. Based on information from TD bilingual children (Squires et al., 2020), we anticipated a positive correlation between cognate performance and age, indicating that older children would show a larger cognate effect than younger children. The magnitude of a cognate effect may also vary based on modality (i.e., greater cognate effect on expressive vs. receptive tasks; Kelley & Kohnert, 2012) and/or proficiency in Spanish, English, or the disparity between the two languages (Pérez et al., 2010; Robinson Anthony & Blumenfeld, 2019).

Method

This study consists of a secondary analysis of data collected from a language intervention for bilingual children with DLD (Ebert et al., 2014), hereafter called the original study. All procedures from the original study were approved by the University of Minnesota Institutional Review Board.

Participants

Participants were 35 bilingual children with DLD (four girls, 31 boys), who ranged in age from 5 to 11 years (Ebert et al., 2014). Participants were enrolled in an urban school district in the Midwest and received English-only educational instruction. All participants had a diagnosis of DLD or equivalent (e.g., primary disability of language impairment) by a school-based speech-language assessment team and were on a speech-language pathologist's caseload at their respective schools. Parent questionnaires were used to confirm parental concern regarding language. Most parents reported that children were first exposed to Spanish and then English (66%), and some noted they were exposed to both Spanish and English from birth (17%; the remaining 17% did not complete this question). Furthermore, the majority of parents reported speaking Spanish at home "most" or "all" of the time (77%), with another 5% reported speaking Spanish "some of the time" (5%; the remaining 18% did not complete this question).

Omnibus tests were used in the original study to confirm DLD status, namely, low language performance in Spanish and English and average nonverbal cognitive skills. For English, mean performance on the CELF-4E (Semel et al., 2003) was a Core Language standard score of 52 (SD = 9), corresponding to < 0.1 percentile or severe impairment. For Spanish, mean performance on the parallel Spanish test (CELF-4S; Wiig et al., 2006) was a Core Language standard score of 66 (SD = 10), corresponding to 1.2 percentile or moderate-to-severe impairment. For nonverbal skills, mean performance on the Test of Nonverbal Intelligence (Brown et al., 1997) was a standard score of 92 (SD = 10), equivalent to 30 percentile or average performance. Other inclusion criteria included passing a pure-tone hearing screening and an absence of other primary diagnoses (e.g., autism, cognitive delay, other health concerns).

Study Tasks and Procedure

As part of the original study, participants completed two tests of English vocabulary: the EOW (Brownell, 2000a), which tests the ability to name a colored illustration of actions, concepts, and objects; and the Receptive One-Word Picture Vocabulary Test–Third Edition (ROW; Brownell, 2000b), which tests the ability to match a spoken word to pictured actions, concepts, and objects in an array of four.

The two English vocabulary tests were administered per standard protocol as described in their respective manuals: Each child obtained a basal and ceiling, which resulted in raw and standard scores for the original study. Because of the standardized administration, participants did not complete every test item. Data analysis for this study was based on the vocabulary items completed by at least one of the 35 participants on the ROW (119 out of 170 possible items) and the EOW (104 out of 170 possible items). Test items below each individual child's basal level or above each child's ceiling were not administered and thus not included in the analysis.

Cognate Classification

For the ROW and EOW tests, items were categorized as either cognate or noncognate using the COSP (Kohnert et al., 2004). This 10-point phonological scale quantifies the degree of overlap between an English word and its Spanish translation based on the initial sound, number of syllables, percentage of overlapping consonant sounds, and percentage of overlapping vowel sounds. A score of 0 would indicate no phonological overlap (e.g., *swing* and *columpio*), while a score of 10 would indicate virtually complete overlap between English and Spanish items (e.g., *sofa* and *sofá*). Consistent with Kelley and Kohnert (2012), word pairs that scored 6 and above were considered cognates, while words with scores less than six were considered noncognates. Word pairs that scored less than 6 indicate little to no phonological overlap (e.g., onion and *cebolla*—score of 3), while a score 6 or greater would indicate a great deal of overlap (e.g., octagon and *octágono*—score of 7, fruit and *frutas*—score of 8).

For the EOW, we used the cognate classification from Kelley and Kohnert (2012). Across all participants, a total of 104 items were administered. Of 104 items administered from the EOW, 28 were classified as cognates (26.9%). We applied Kelley and Kohnert's procedures to classify ROW items in this study. First, ROW items were translated to Spanish using the Spanish-Bilingual version (Brownell, 2001). All translations were confirmed by a master's level speech-language pathology student and a doctoral level researcher from the original study, both of whom were fluent in Spanish, with the former being a native Spanish speaker. Eight items from the English ROW did not have translations in the Spanish-Bilingual version because these items were not part of the bilingual test. The first author translated these words using the Merriam-Webster Spanish–English Dictionary (Merriam-Webster Spanish–English Dictionary, n.d.) and confirmed accuracy with the aforementioned individuals. Then the English vocabulary words and the Spanish translations were transcribed with broad phonetic transcription. Those transcriptions were used to code and score the Spanish–English pairs for cognate status (i.e., cognate or noncognate) using the COSP. Based on these procedures, 38 of 119 items in the ROW (31.9%) were classified as cognates.

Difficulty Levels

Because the ROW and EOW were originally designed to increase in difficulty as the test progresses, we operationally defined levels of difficulty (easy, medium, and hard) based on the order of item administration in each test. It is noted that this method is not without flaws. Wood and Peña (2015) suggest that the distribution and progression of difficulty on standardized vocabulary tests may be biased against children who are dual language learners. With this caveat in mind, few studies have investigated phonological (spoken) cognate performance as it relates to word difficulty, particularly in a bilingual population with DLD. As an initial step, we followed procedures outlined in Kelley and Kohnert (2012) to separate items into three levels of difficulty.

Following Kelley and Kohnert (2012), test items were evenly divided into three levels of difficulty to allow for a more in-depth analysis of cognate performance. Levels for the ROW are as follows: easy = 1–39, medium = 40–79, and difficult = 80–119. Levels for the EOW are as follows: easy = 1–34, medium = 35–69, and difficult = 70–104. There was an uneven distribution of cognates on the tests. For ROW, the percentage of cognates seemed to increase with difficulty level: four of 39 easy items (10.3%), 15 of 40 medium items (37.5%), and 19 of 40 hard items (47.5%). For EOW, the percentage of cognates was similar across difficulty level: eight of 34 easy items (23.5%), 10 of 35 medium items (28.6%), and 10 of 35 hard items (28.6%).

Data Analysis

Children's performance on each test (EOW, ROW) was calculated as the proportion of cognates correctly named or identified, respectively, and the proportion of noncognates correctly named or identified. To address the first and second research questions, we compared performance on cognates versus noncognates using a series of paired sample t tests for each of the two tests (EOW, ROW) at each difficulty level. Cohen's d was calculated to indicate the effect size of each proportion comparison, with a large effect size defined as $d = 0.8$, a moderate effect size of $d = 0.5$, and a small effect size of $d = 0.2$ (Cohen, 1988). In addition to the group-level analysis, a cognate effect at the individual level was calculated as the total proportion of cognates minus the total proportion of noncognates, where a value > 0 would indicate a cognate effect.

To address the third research question, we calculated the proportion of correct cognates minus the proportion of correct noncognates for each test to form two composites of cognate performance: Cognate ROW and Cognate EOW. Then, we calculated Pearson's correlations to examine associations among factors that could influence cognate performance, including chronological age, overall English proficiency (i.e., CELF-4E), overall Spanish proficiency (i.e., CELF-4S), English receptive vocabulary knowledge (ROW), and English expressive vocabulary knowledge (EOW). All data were analyzed in SPSS v25 (IBM Corporation, 2017), with $p < .05$ as the significance level when comparing the differences between cognate and noncognate scores. With regard to the correlation analysis, a Benjamini and Hochberg False Discovery Rate (FDR)

(Benjamini & Hochberg, 1995) –adjusted p value (q value) of .05 was used to set as the significance level.

Results

With regard to the first research question, results of cognate performance across levels of difficulty on the ROW were mixed for these children with DLD. As shown in Table 1, there was a significant difference between overall performance on cognates compared to noncognates on the ROW, $t = 3.01$, $p = .005$, with a moderate effect size ($d = 0.51$). In contrast to our prediction, children identified more noncognates ($M = 0.83$, $SD = 0.06$) than cognates ($M = 0.77$, $SD = 0.12$). The ROW was divided into three levels of difficulty (i.e., easy, medium, and hard), and only the items in the medium level showed a significant difference, with performance on cognates being higher ($M = 0.76$, $SD = 0.16$) than noncognates ($M = 0.64$, $SD = 0.19$), $t = 4.18$, $p < 001$, with a medium effect size, $d = 0.73$. Cognate–noncognate differences were not significant at easy or hard levels. At the individual level, 12 of 35 participants (34%) showed a cognate effect. The ROW differences between cognates and noncognates ranged from −0.31 to 0.13 ($M = -0.06$, $SD = 0.11$). For the participants showing a cognate effect, the ROW differences ranged from 0.02 to 0.13 with an average score of 0.06 ($SD = 0.04$).

With regard to the second research question, results of cognate performance across levels of difficulty on the EOW were significant. On the EOW, overall performance was higher for cognates ($M = 0.75$, $SD = 0.11$) than noncognates ($M = 0.65$, $SD = 0.13$), $t = 4.19$, $p < .001$, with a medium effect size, $d = 0.71$. The EOW was also divided into three levels of difficulty, and significantly higher performance on cognates was observed at all three levels, with effect sizes ranging from medium to large, $d = 0.46$–1.00. At the individual level, 28 of 35 participants (80%) showed a cognate effect on the EOW. The EOW differences between cognates and noncognates ranged from −0.28 to 0.43 ($M = 0.10$, $SD = .14$). For the participants showing a cognate effect, the EOW differences ranged from 0.01 to 0.43 with an average score of 0.15 ($SD = 0.10$).

With regard to the third research question, few variables were associated with cognate performance. As shown in Table 2, better performance on cognates in the ROW (Cognate ROW) was associated with older age ($r = .510$, $p = .002$) and higher English proficiency (i.e., CELF-4E, $r = .475$, $p = .005$). In contrast, cognate performance in the EOW (Cognate EOW) was not related to any variable.

Discussion

Cognate Performance

This study investigated cognate performance in bilingual children with DLD using English vocabulary tests. As predicted, we found more robust effects in the expressive versus receptive modality. Results from the EOW revealed a clear effect for cognates, indicating that participants named a higher proportion of cognates than noncognates. The cognate effect was consistent with moderate-to-large effect sizes in all three difficulty levels. Similar to

Table 1. Proportion of correct responses for cognates versus noncognates by test.

ROW	*n*	*M*	*SD*	*t*	*p*	*d*	EOW	*n*	*M*	*SD*	*t*	*p*	*d*
All levels	35			3.01	**.005**	0.51	All levels	35			4.19	**< .001**	0.71
Noncognates		0.83	0.06				Noncognates		0.65	0.13			
Cognates		0.77	0.12				Cognates		0.75	0.11			
Total		0.81	0.06				Total		0.67	0.11			
Easy	35			0.19	.850	0.03	Easy	35			4.03	**< .001**	0.68
Noncognates		0.97	0.07				Noncognates		0.84	0.17			
Cognates		0.96	0.11				Cognates		0.92	0.12			
Medium	33			4.18	**< .001**	0.73	Medium	34			2.68	**.011**	0.46
Noncognates		0.64	0.19				Noncognates		0.46	0.23			
Cognates		0.76	0.16				Cognates		0.62	0.21			
Hard	16			1.78	.095	0.45	Hard	11			3.31	**.008**	1.00
Noncognates		0.33	0.21				Noncognates		0.20	0.11			
Cognates		0.52	0.39				Cognates		0.49	0.28			

Cognate–noncognate differences	*n*	*M*	*SD*	Min	Max	Cognate–noncognate differences	*n*	*M*	*SD*	Min	Max
Overall	35	−0.06	0.11	−0.31	0.13	Overall	35	0.10	0.14	−0.28	0.43
Cognate effect	12	0.06	0.04	0.02	0.13	Cognate effect	28	0.15	0.10	0.01	0.43

Note. Results are from paired samples t tests with Cohen's d as the effect size. Bold p values are statistically significant. ROW = Receptive One-Word Picture Vocabulary Test–Third Edition, English; EOW = Expressive One-Word Picture Vocabulary Test–Third Edition, English. Cognate effect = better performance on cognates than noncognates.

Table 2. Correlations between age, language proficiencies, and cognate performance.

Variable	CELF-4E	CELF-4S	ROW	EOW	Cognate ROW	Cognate EOW
Age	**.455***	–.266	.203	.314	**.510***	.154
CELF-4E		.278	**.421***	**.490***	**.475***	.186
CELF-4S			–.166	.105	.158	.054
ROW				.385	.040	–.117
EOW					.321	.204
Cognate ROW						–.016

Note. CELF-4E = Clinical Evaluation of Language Fundamentals–Fourth Edition, English; CELF-4S = Clinical Evaluation of Language Fundamentals–Fourth Edition, Spanish; ROW = Receptive One-Word Picture Vocabulary Test–Third Edition, English standard score; EOW = Expressive One-Word Picture Vocabulary Test–Third Edition English standard score; Cognate ROW = proportion of correct cognates minus proportion of correct noncognates from the Receptive One-Word Picture Vocabulary Test; Cognate EOW = proportion of correct cognates minus proportion of correct noncognates from the EOW.

*Significance with False Discovery Rate adjusted *p* value (Benjamini & Hochberg, 1995).

their TD peers (Kelley & Kohnert, 2012; Squires et al., 2020), bilinguals with DLD show a cognate effect when naming pictures (see also Grasso et al., 2018). These results suggest that bilingual children with DLD are able to use their Spanish knowledge to produce vocabulary words in English.

In contrast, the cognate effect in the receptive modality was mixed. When all test items were examined on the ROW, there was a significant effect, but in the opposite direction than anticipated. Participants identified more noncognates than cognates. However, when the ROW was divided into the three levels of difficulty (i.e., easy, medium, hard), participants identified significantly more cognates than noncognates on the medium difficulty level. The easy and hard levels did not show significant differences in cognate performance. Even though, on average, bilingual children with DLD performed more accurately on the receptive task than expressive task (see Table 1), they appeared to utilize their cognate knowledge more clearly on the expressive task. Further investigation is needed to examine whether robust cognate effects in the expressive modality and inconsistent effects in the receptive modality are characteristic of bilinguals with DLD.

Our results differed from Kelley and Kohnert (2012), which found a cognate effect on their receptive vocabulary task at all difficulty levels, albeit with small effect sizes. It should be noted that participants in Kelley and Kohnert (2012) were older on average than our sample. Older children, in general, may show more cognate effects than younger children (Squires et al., 2020). Differences in study results could also be related to the analytical approach. This study compared performance with participants as the unit of analysis, whereas Kelley and Kohnert (2012) analyzed differences based on items. Using participants as the unit of analysis (vs. an item-based approach) aligned more clearly to the overall goal of this study, namely, to capture cognate effects in children rather than in the tasks employed. Differences between studies could also be due to the receptive vocabulary test employed (ROW vs. PPVT-III). The PPVT-III had a greater number of cognates (94 out of 204 items) compared to the ROW (29 out of 119 items). The reduced number of cognates available on the ROW may have limited the ability to detect cognate effects in this study. However, it is notable that the ROW had a similar percentage of cognates as the EOW (35.6% or 37 of 104 items), yet a robust cognate effect was found on the EOW across difficulty levels.

In addition to methodology, differences between studies may also be related to ability status. Kelley and Kohnert (2012) studied TD bilinguals, whereas this study focused on bilingual children with DLD. Children with DLD have been found to have more difficulties in spoken word recognition than their TD peers (e.g., Rice & Hoffman, 2015); consistent with this area of weakness, children with DLD have difficulty recognizing cognate status when listening to words.

Factors Related to Cognate Performance

Notably, not all children in the study showed a cognate effect. Studies of TD bilingual children have found that 60%–80% of individuals demonstrated a cognate effect (e.g., Kelley & Kohnert, 2012; Robinson Anthony & Blumenfeld, 2019). In this study, most bilingual children with DLD showed a cognate effect on the EOW (80%), whereas a smaller percentage showed this effect on the ROW (31%). Thus, the secondary aim for this study was to examine factors associated with cognate performance.

We examined potential factors such as chronological age, English proficiency, Spanish proficiency, and vocabulary knowledge (see Table 2). Cognate performance from the ROW was correlated with two variables, age and English proficiency, as measured by the CELF-4E. Participants who identified more cognates than noncognates on the ROW tended to be older and tended to have higher English proficiency. Like Kelley and Kohnert (2012), we found that the receptive cognate effect related to age.

However, our results differed from Kelley and Kohnert (2012) in that English proficiency was related to cognate performance, at least in the receptive modality. Though Kelley and Kohnert (2012) also used the CELF Core scores to measure proficiency (albeit a previous version of the tests), they did not find any associations between proficiency and cognate performance. Differences in results could be related to the target population. Participants in this study had DLD with CELF-4E scores in the severely impaired range. Our results suggest that a certain level of English proficiency may be needed to tap into a cognate advantage. Once a certain threshold of proficiency is attained (as in the typical participants in Kelley & Kohnert, 2012), a more consistent cognate effect might occur.

In contrast, the robust cognate effects found on the EOW did not seem to vary by the factors that were measured. Cognate performance on the expressive vocabulary test (EOW) was not associated with any other variable. These findings replicated Kelley and Kohnert (2012), who also used the EOW, and did not find any significant correlations between expressive cognate effects and factors of age, proficiency, or vocabulary knowledge. Future investigation is needed to help identify other factors that could help to explain why bilingual children, typical or with DLD, are able to name more cognates than noncognates.

Limitations and Future Directions

One limitation is that we did not have participant performance data for the Spanish ROW and EOW. Thus, we were not able to compare performance across languages. Also, the ROW and EOW were not originally designed to study cognate performance; thus, cognates were not evenly distributed in each test. Studies that have created experimental tasks designed to measure cognate performance have found more robust effects (e.g., Sheng et al., 2016). However, these experimental tasks have focused on a narrow age range, such as preschoolers. Future investigations will need to strike a balance between carefully constructed stimuli and capturing cognate effects across ages. Related to the tasks themselves, we defined difficulty by item order that has its limitations (Wood & Peña, 2015). Future investigation on the role of word difficulty on cognate performance could incorporate measures of word frequency or age of acquisition.

Another limitation is in how proficiency was defined. In this study, cognate effects in EOW were not associated with direct measures of language proficiency. This study, like Kelley and Kohnert (2012), defined proficiency based on CELF Core Language scores. The CELF Core Language score is a combination of receptive and expressive tasks. It would have been useful to have separate receptive and expressive subscale scores to reveal a more nuanced depiction of language proficiency in terms of relative strengths and weaknesses in each language. Relatedly, we did not have a detailed measure of language exposure beyond the general questions reported in the Participants section. Studies that have used more extensive report measures of language exposure have been able to examine more detailed associations between exposure and cognate performance (e.g., Robinson Anthony & Blumenfeld, 2019). Further investigation on proficiency and cognate performance could benefit from measuring proficiency using multiple methods.

Concluding Remarks

This study adds to the small but growing body of research on cognate performance in bilingual DLD populations. Collective findings indicate that bilingual children with DLD are sensitive to cognate status and that cognates may be a viable intervention target. Capitalizing on cognates, at least in the expressive modality, may be a useful strategy to incorporate into language intervention to support vocabulary learning across languages (e.g., Dam et al., 2020).

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